WM-DDI

SERVICE MANUAL

AEP Model

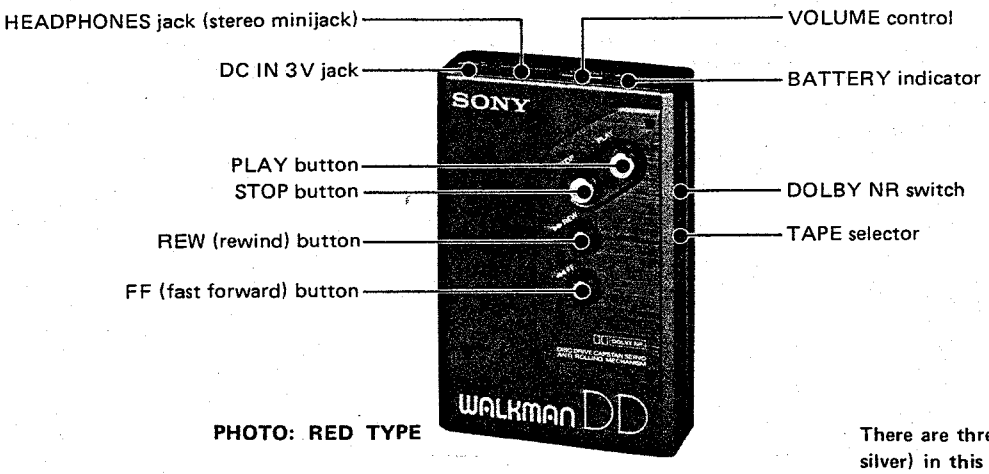


PHOTO: RED TYPE

There are three color types (red, black and silver) in this model.

SPECIFICATIONS

Frequency response
40–15,000 Hz
Wow and flutter
±0.17% (DIN) /0.1% WRMS (NAB)
Power output
Headphones: 20 mW + 20 mW (at 10% harmonic distortion)
load impedance 18 ohms at DC operation
Outputs
HEADPHONES jack (stereo minijack)
load impedance 8–300 ohms
Power requirements
3 V DC, two R6 (size AA) batteries
DC IN 3 V jack accepts:
—EBP-500B battery case (optional) for use on two R20 (size D) batteries
—AC-D2M AC power adaptor (optional) for use on 220 V AC, 50 Hz
—DCC-70 car battery cord (optional) for use on 12 V car battery
Dimensions
Approx. 81.2×119×36.5 mm
incl. projecting parts and controls
Weight
Approx. 235 g incl. batteries, not incl. other accessories
Accessories supplied
Stereo headphones (1), Carrying case (1)

Model Name Using Similar Mechanism	NEW
Tape Transport Mechanism Type	MT-WMDD1-16

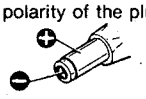
• **Battery life**

Batteries	Continuous playback hours
Sony batteries SUM-3 (NS)	Approx. 3.5 hrs.
Sony alkaline batteries AM3 (N)	Approx. 7 hrs.

For maximum performance we recommend the use of alkaline batteries.

Notes

- This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.
- If a car battery cord or an AC power adaptor not manufactured by Sony is used, a fuse must be installed in the battery cord or adaptor and the polarity of the plug must be as illustrated.



Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
"DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

STEREO CASSETTE PLAYER

SONY®

MICROFILM

TC

SERVICING NOTE

Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Notes on replacing the speed detection coil (FG901)

FG901 is pressed in chassis.
Replace as chassis ass'y when FG901 is defective.
Decide if FG901 is defective or not by removing lead wires of FG901 from audio board and measuring DC resistance value.

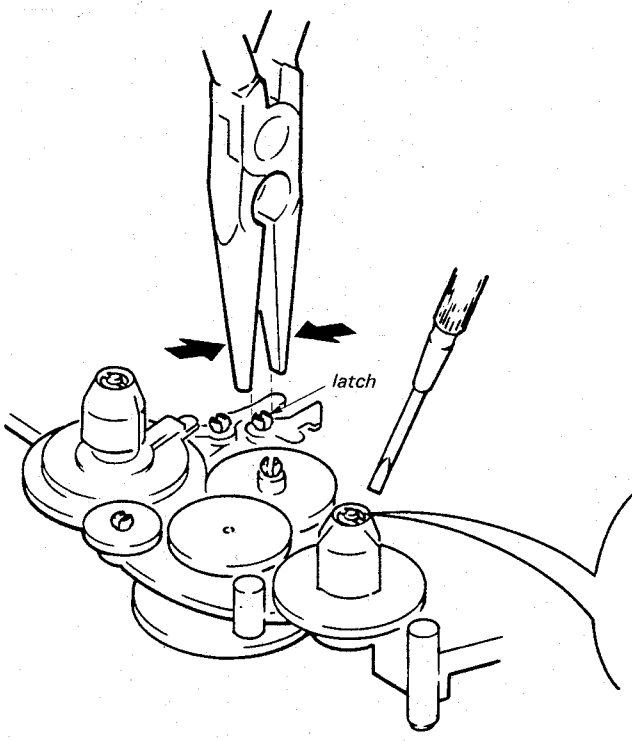
DC resistance value of FG901: Approx. 690Ω

SECTION 1
DISASSEMBLY

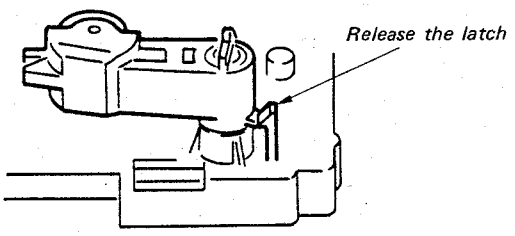
The chassis (CHASSIS ASSY) should be handled with care not to break the latches, etc. If breaking, it must be replaced with a new one.

EACH LEVER AND GEAR REMOVAL

Remove each lever and gear nipping the latch with round nose plier as illustrated below.



PINCH ROLLER REMOVAL



TAKE-UP REEL GEAR AND SUPPLY REEL GEAR REMOVAL.

❶ *Insert a precision screwdriver in this portion.*

❷ *Expand the stopper with the precision screwdriver and remove a reel gear.*

SECTION 2
ADJUSTMENTS

PRECAUTION

1. Clean the following parts with a denatured-alcohol-moistened swab:

   playback head — pinch roller
   capstan — rubber belt

2. Demagnetize the playback head with a head demagnetizer.
3. Do not use a magnetized screwdriver for the adjustments.
4. After the adjustments, apply suitable locking compound to the parts adjusted.
5. The adjustments should be performed with the rated power supply voltage unless outherwise noted.

3-1. MECHANICAL ADJUSTMENT

Torque Measurement

Power supply voltage: 2.5 V

	Torque meter	Meter reading
FWD	CQ-102C	22 – 38 g•cm (0.3 – 0.52 oz•inch)
FF, REW	CQ-201B	More than 65 g•cm (More than 9.04 oz•inch)
Back Tension	CQ-102C	1 – 2 g•cm (0.01 – 0.02 oz•inch)
Tape Pulling Force	CQ-403	More than 60 g•cm (More than 0.84 oz•inch)

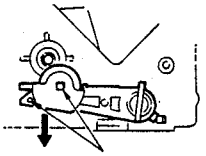
Pinch Roller Pressure Adjustment

– Playback Mode –

1. Pull the spring scale in the direction shown by the arrow.
2. Slowly return the pinch roller and read the spring scale just when the pinch roller starts rotating.

Specification:

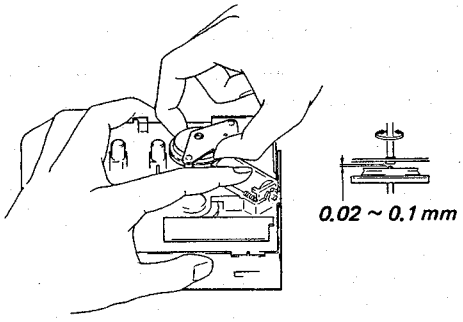
170 ± 20 g (5.3 ~ 6.7 oz)



Hook the spring scale to one of these holes and pull it in the direction of arrow.

Wow & flutter and motor position

1. Adjust with the adjustment screw so that rotor thrust play is within 0.1 mm. (When confirming play, press motor down so that the motor pulley and rotor rubber section do not touch.)



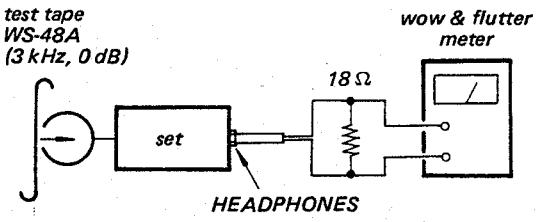
2. Wow & flutter adjustment

Setting:

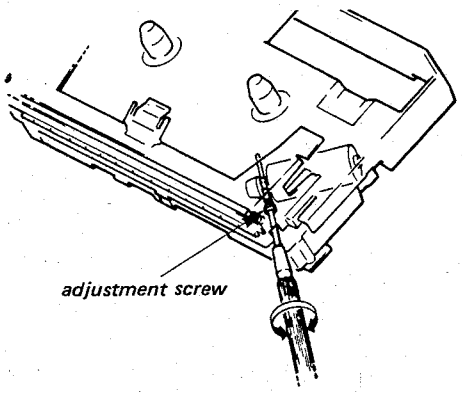
Power supply voltage: 2.5 V
Tape: Adjust by using end portion of tape.
VOLUME control: mechanical mid
TAPE SELECT switch: NORM
BOLBY NR switch: OFF

Procedure:

1 Mode: playback



Turn the adjustment screw so that the wow and flutter meter reads minimum (less than 0.12% W•RMS).



2-2. ELECTRICAL ADJUSTMENTS

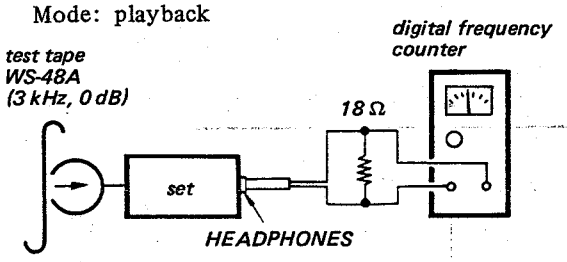
Tape Speed Adjustment

Setting:

VOLUME control: mechanical mid
TAPE SELECT switch: NORM
DOLBY NR switch: OFF

Procedure:

Mode: playback



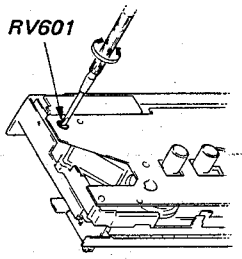
1. Turn RV601 so that frequency reading becomes in 3,000 Hz. (at the ending part of the test tape)
2. Play back the test tape top and end and confirm that the frequency reading becomes in the specification below.

Specification:

Digital frequency counter
3000 Hz ± 90 Hz

Adjustment Location:

– main board –



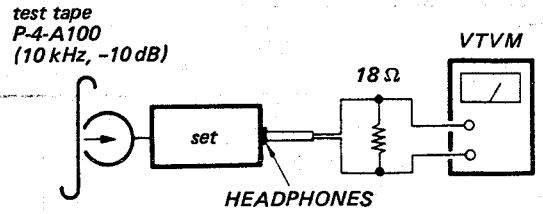
Playback Head Azimuth Adjustment

Setting:

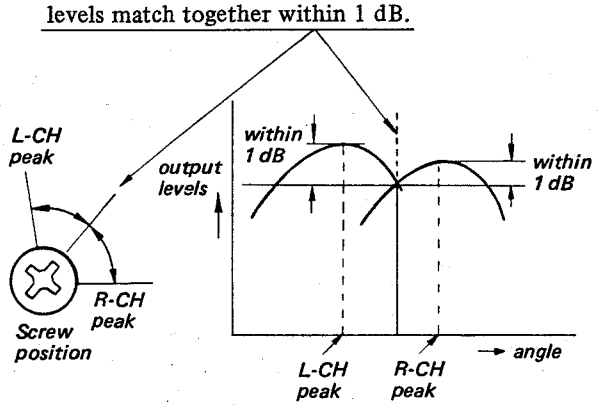
VOLUME control: mechanical mid
TAPE SELECT switch: NORM
DOLBY NR switch: OFF

Procedure:

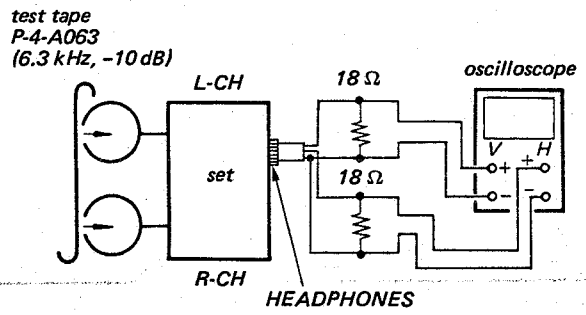
1. Mode: playback



2. Turn the adjustment screw for the maximum output levels. If these levels do not match, turn the adjustment screw until both of output levels match together within 1 dB.



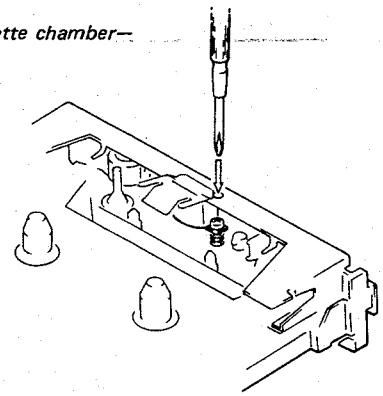
3. Phase Check
Mode: playback



Screen pattern				
in phase	45°	90°	135°	180°
good			wrong	

Adjustment Location:

– cassette chamber –



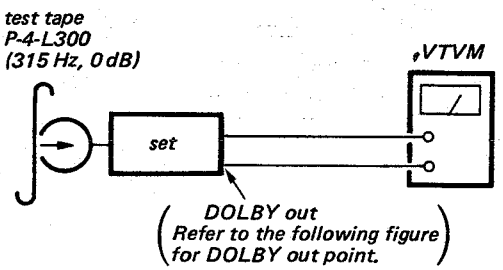
Playback Level Adjustment

Setting:

VOLUME control: mechanical mid
TAPE SELECT switch: NORM
DOLBY NR switch: OFF

Procedure:

Mode: playback



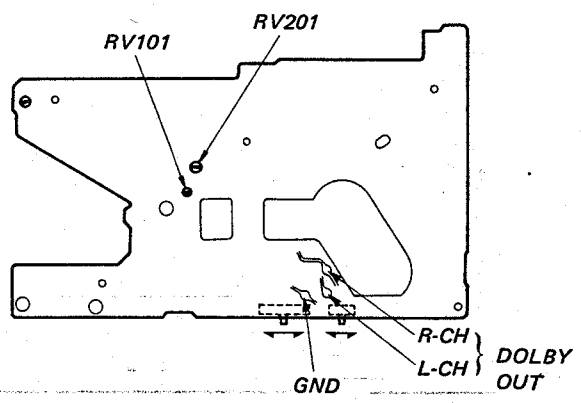
Specification:

DOLBY out level: 0.073 V (−20.5 ± 0.5 dB)

1) If necessary, adjust RV101 (L-CH) and RV201 (R-CH) for the specification.
2) Confirm that the output level of DOLBY out is not changed when repeating playback and stop.

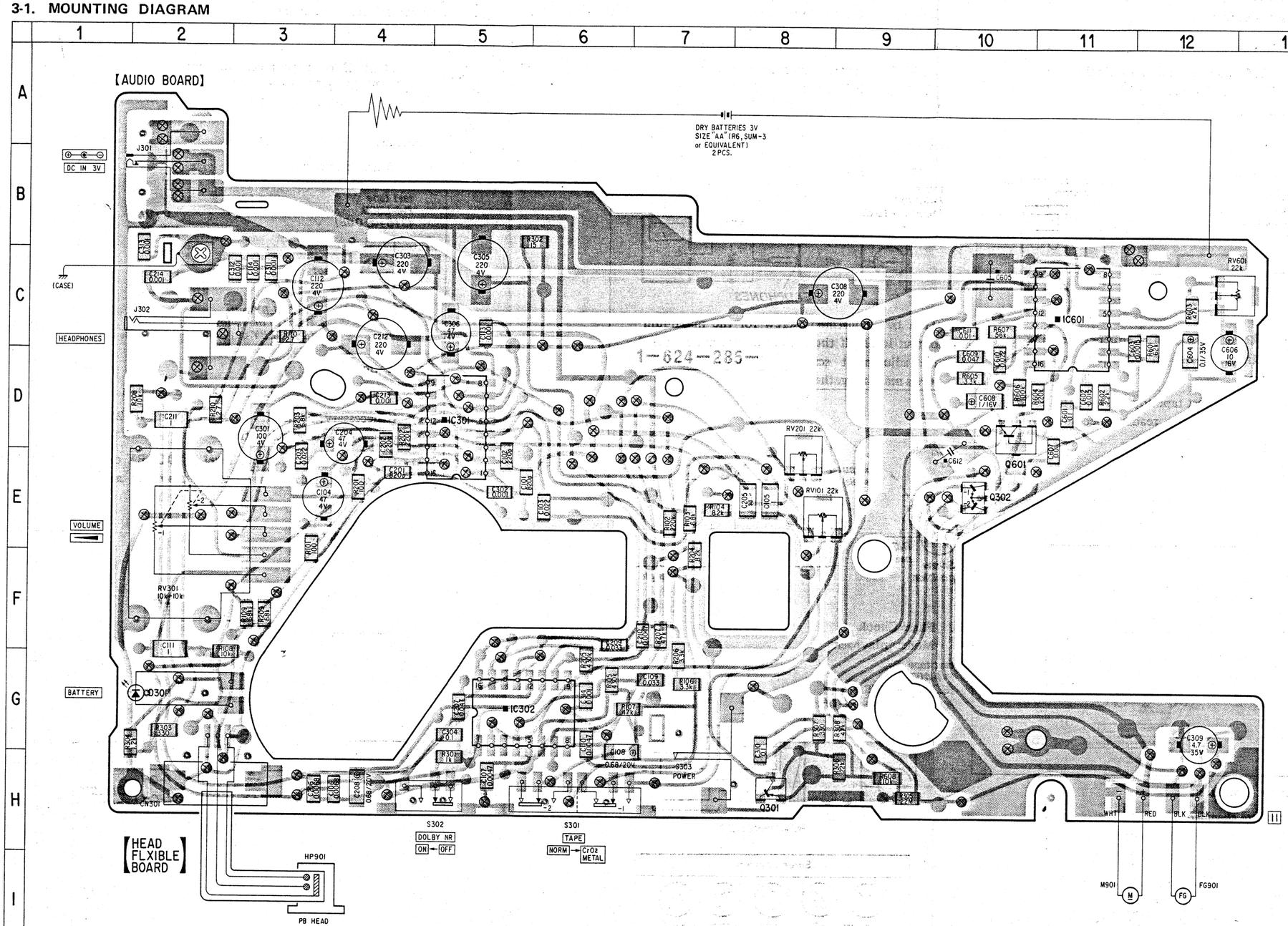
Adjustment Location:

– main board –



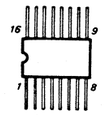
SECTION 3
DIAGRAMS

3-1. MOUNTING DIAGRAM



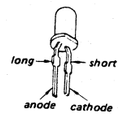
• Semiconductor Lead Layouts

CX20084
LA4570M
NJM2063AM

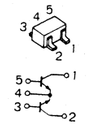


2SB624-BV4

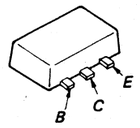
TLR124



FMW1



2SB798



• Semiconductor Location

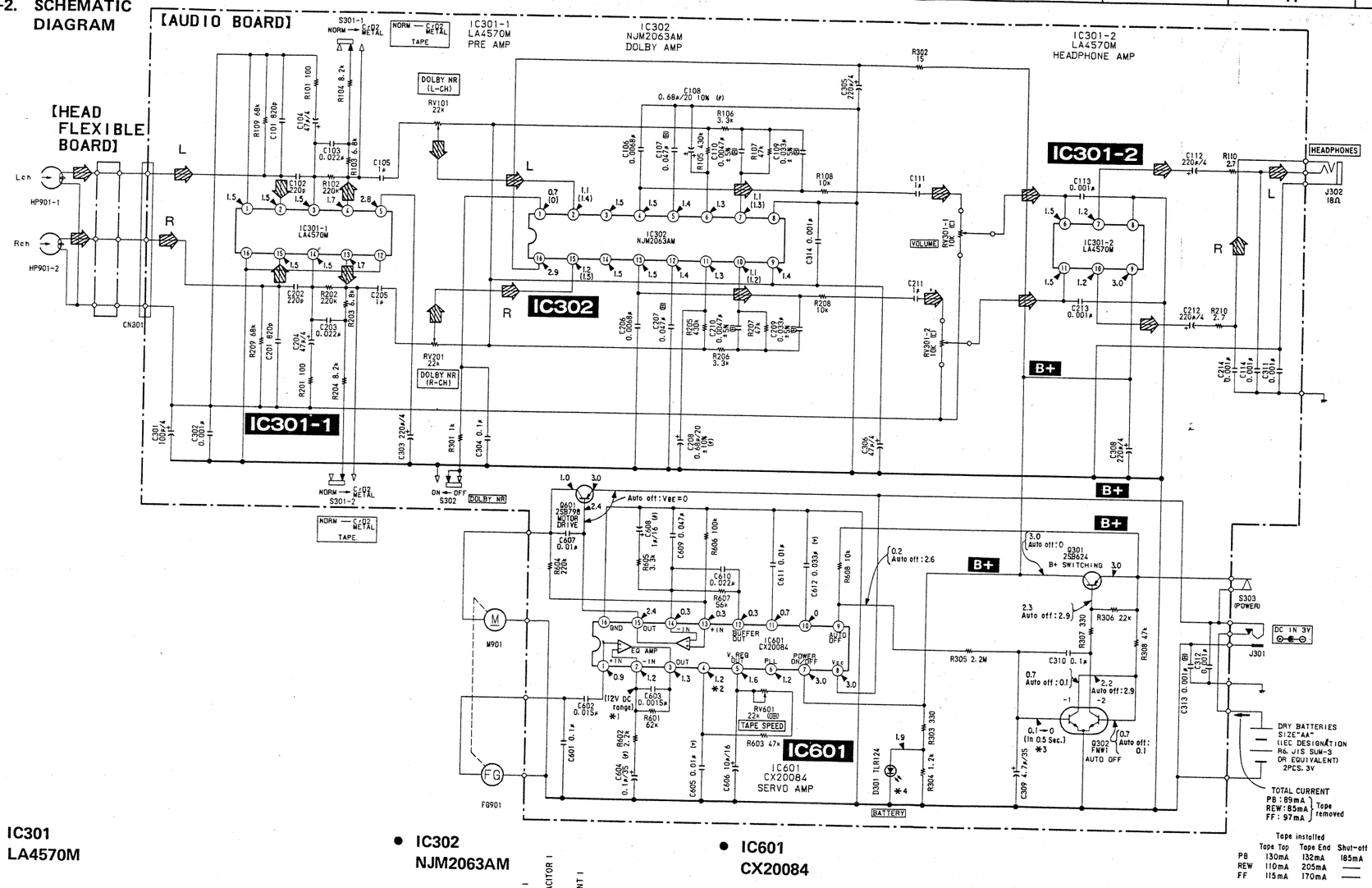
Ref. No.	Location
IC301	D-5
IC302	G-5
IC601	C-11
Q301	H-8
Q302	E-10
Q601	D-10
D301	G-2

Note:

- ○— : parts extracted from component side.
- ■ : part mounted on the conductor side.
- ⊗ : Through hole.
- ▒▒ : component-side pattern.

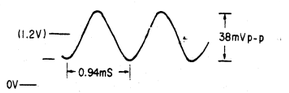
3-2. SCHEMATIC DIAGRAM

【AUDIO BOARD】

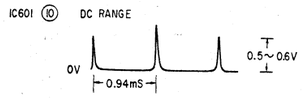


TEST POINTS, WAVE FORMS AND OPERATING VOLTAGES

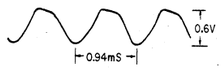
IC601 ① AC RANGE



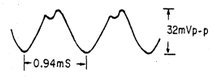
IC601 ⑩ DC RANGE



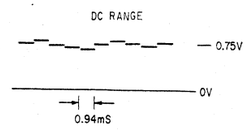
IC601 ③ AC RANGE



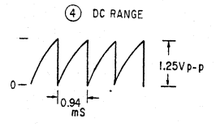
IC601 - ② AC RANGE



DC RANGE



④ DC RANGE

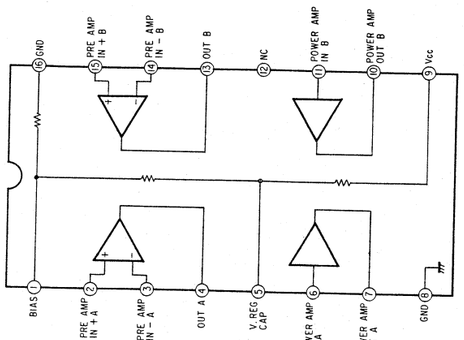


Note:

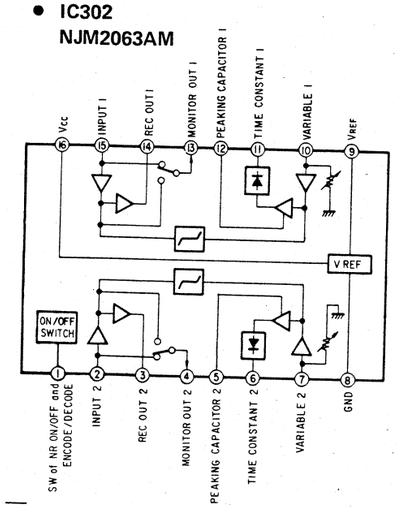
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/10W or less unless otherwise specified.
- ▨ : signal paths.
- % : tolerances
- ▭ : adjustment for repair.
- Power voltage is 3 V and fed with regulated dc power supply from the battery terminals. Voltages are dc with respect to ground in PLAY mode. Voltage variations may be noted due to normal production tolerances.
- Switches

Ref. No.	Switch	Position
S301	NORM/CrO_2, METAL	NORM
S302	DOLBY NR	OFF
S303	POWER	OFF

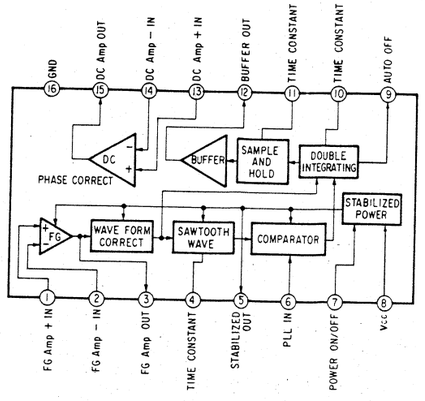
- **IC301**
  LA4570M



- **IC302**
  NJM2063AM



- **IC601**
  CX20084



Note:

*1 The number is a reading measured in 12 V range of a VOM. If this point is measured in 3 V range, the motor current abnormally increases. Do not keep this situation long.

*2 While this pin is touched with the probe of a VOM, the motor stops turning.

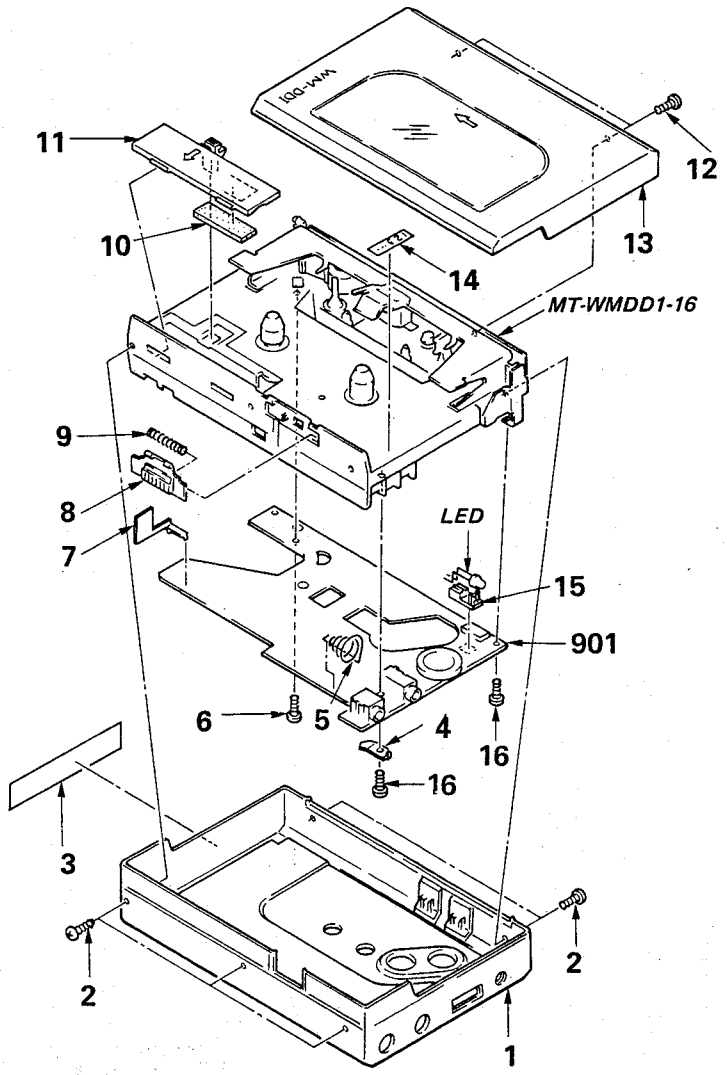
*3 While this portion is measured with a VOM, C309 will be discharged.

*4 This LED will go out when the power supply voltage deceases to 2.2 V.

SECTION 4
EXPLODED VIEWS AND PARTS LIST

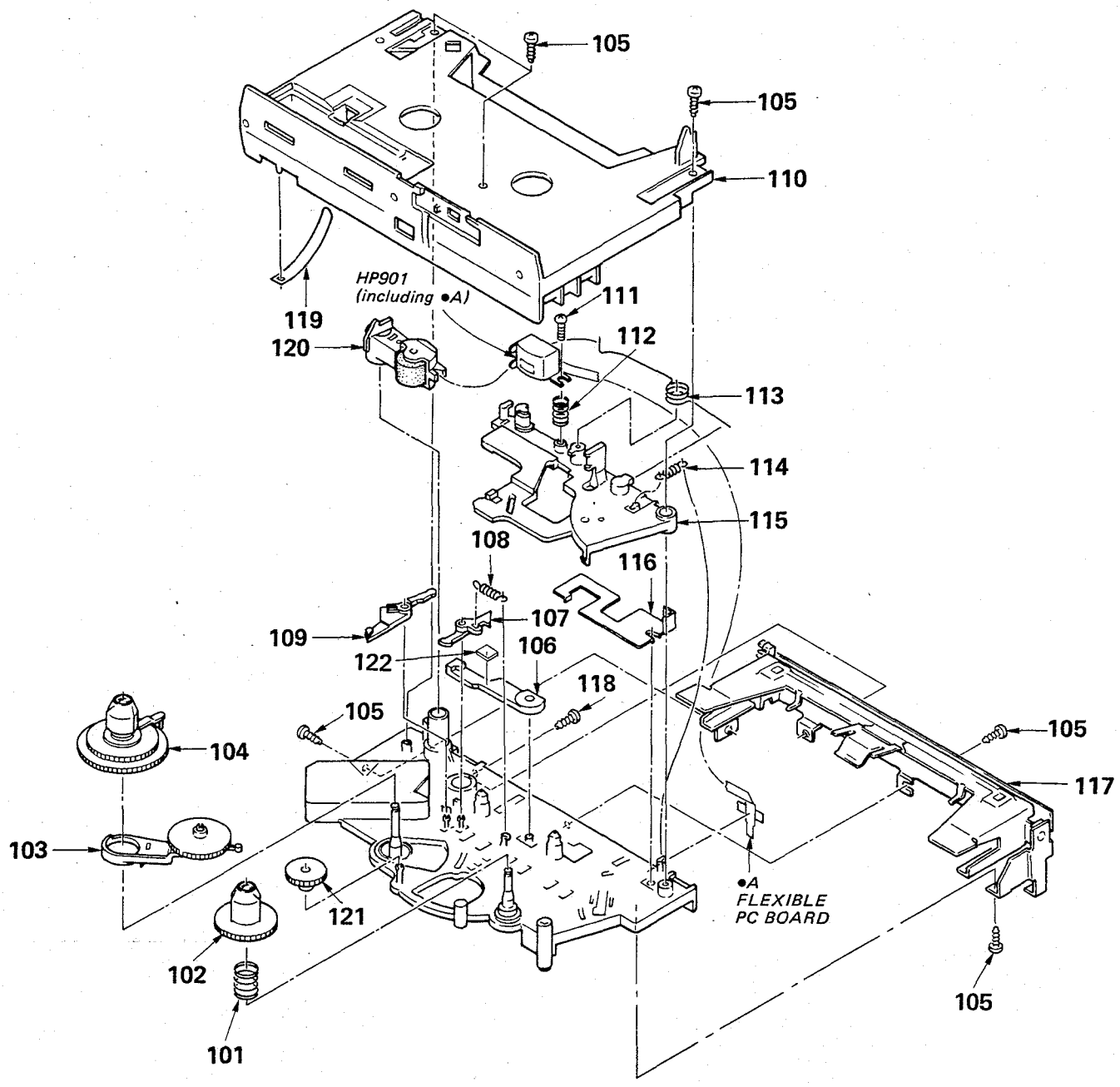
NOTE:
- The mechanical parts with no reference number in the exploded views are not supplied.
- Items marked " ★ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Color Indication of Appearance Parts
  Example: (RED) ..... KNOB, BALANCE (WHITE)
  (RED) = Cabinet's Color; (WHITE) = Parts' Color

4-1. CABINET



No.	Part No.	Description	Remarks
1	X-3310-967-1	(RED).....CASE ASSY, WITH KNOB (RED)	
	X-3310-968-1	(SILVER)...CASE ASSY, WITH KNOB (SILVER)	
	X-3310-969-1	(BLACK)....CASE ASSY, WITH KNOB (BLACK)	
2	3-893-942-01	SCREW (1.7X4), TAPPING (B)	
3	*3-324-445-01	(SILVER,RED)...LABEL, MODEL NUMBER	
	*3-324-445-11	(BLACK).....LABEL, MODEL NUMBER	
4	3-324-444-01	SPRING	
5	3-324-448-01	SPRING	
6	7-627-852-07	SCREW, PRECISION +P 1.7X2.5	
7	3-324-450-01	TERMINAL BOARD, BATTERY	
8	3-310-983-02	BUTTON, LOCK	
9	3-343-530-01	SPRING, COMPRESSION	
10	9-911-815-01	CUSHION, MICROPHONE	
11	3-324-459-01	LID, BATTERY CASE	
12	3-893-942-11	SCREW (1.7X3), TAPPING (B)	
13	X-3310-964-1	(SILVER)...LID ASSY (SILVER), CASSETTE	
	X-3310-965-1	(BLACK)....LID ASSY (BLACK), CASSETTE	
	X-3310-966-1	(RED).....LID ASSY (RED), CASSETTE	
14	*3-701-999-00	LABEL, SERIAL NUMBER	
15	*3-343-524-01	HOLDER, LED	
16	3-893-942-31	SCREW (1.7X4), TAPPING (B)	
901	A-3070-220-A	MOUNTED PCB, AUDIO	

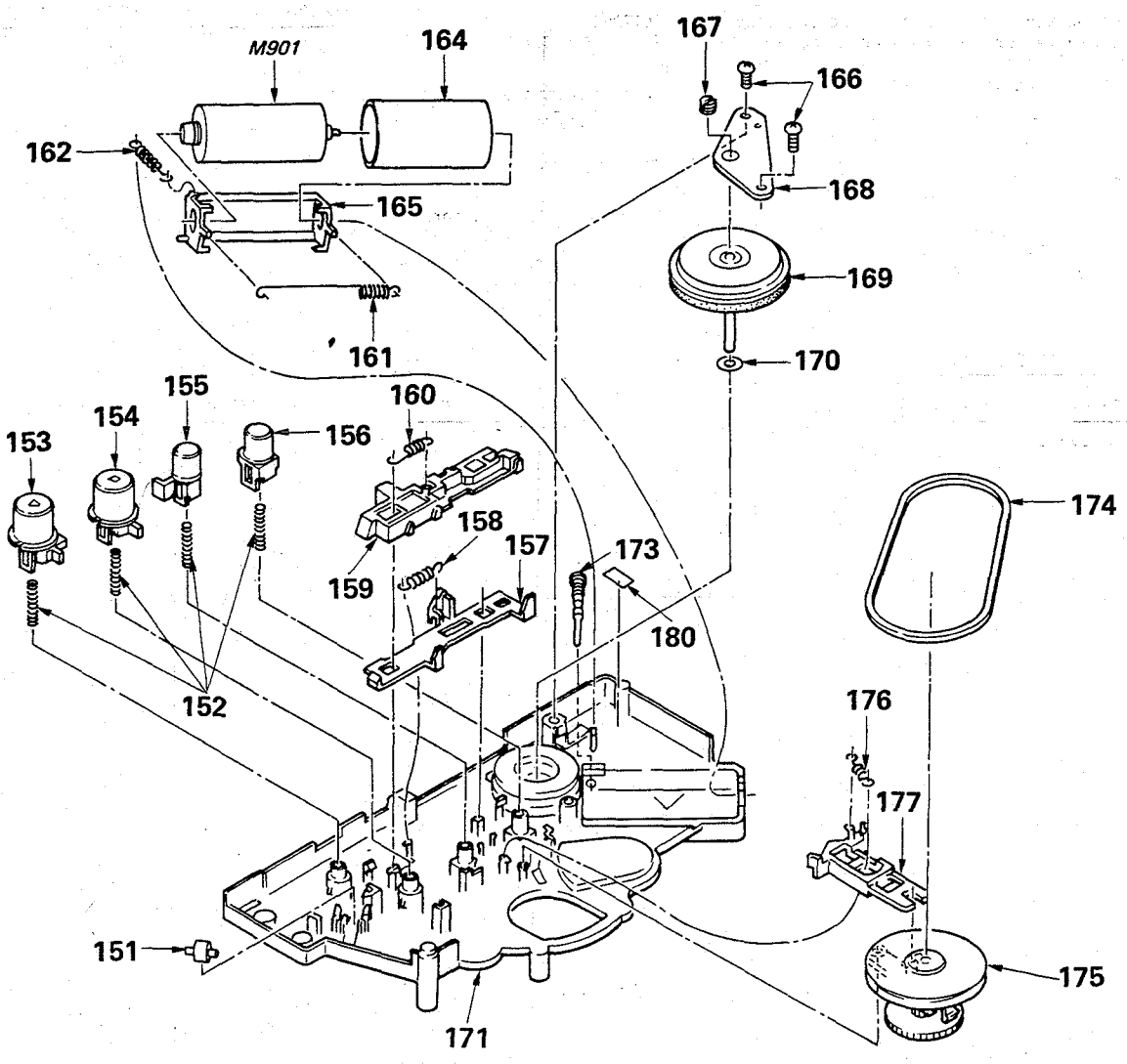
4-2. TAPE TRANSPORT MECHANISM (1)
MT-WMDD1-16



No.	Part No.	Description	Remarks
101	3-343-505-01	SPRING, COMPRESSION	
102	3-324-478-01	GEAR (S REEL)	
103	X-3310-958-1	ARM ASSY, PLAY	
104	X-3310-956-1	REEL ASSY, T	
105	3-893-942-01	SCREW (1.7X4), TAPPING (B)	
106	3-324-493-01	LEVER (S.OFF)	
107	3-343-508-01	LEVER (DETECTION SAFETY)	
108	3-343-509-01	SPRING, TENSION	
109	X-3310-977-1	ARM ASSY (DETECTION)	
110	X-3310-963-1	CHASSIS ASSY, SUB	
111	3-336-706-01	SCREW (IT3-C), TAPPING	
112	3-343-506-01	SPRING, COMPRESSION	

No.	Part No.	Description	Remarks
113	3-343-519-01	SPRING	
114	3-343-503-01	SPRING, TENSION	
115	3-343-513-01	CHASSIS, HEAD	
116	3-324-465-01	LEVER (RELEASE)	
117	X-3310-974-1	HINGE ASSY	
118	3-893-942-11	SCREW (1.7X3), TAPPING (B)	
119	9-911-816-01	RIBBON	
120	X-3310-962-1	PINCH LEVER ASSY	
121	3-324-495-01	GEAR (FF)	
122	*3-317-714-01	BRACKET, SWITCH	
HP901	1-543-481-11	HEAD, MAGNETIC (PLAY BACK), WITH FLEXIBLE PC BOARD	

4-3. TAPE TRANSPORT MECHANISM (2)
MT-WMDD1-16



No.	Part No.	Description	Remarks
151	3-324-498-01	SHAFT (ROLLER)	
152	3-324-497-01	SPRING, COMPRESSION	
153	X-3310-971-1	LEVER ASSY, PLAY BUTTON	
154	X-3310-972-1	LEVER ASSY, STOP BUTTON	
155	X-3310-973-1	LEVER ASSY, REW BUTTON	
156	X-3310-970-1	LEVER ASSY, FF BUTTON	
157	3-343-512-01	LEVER (SW)	
158	3-343-509-01	SPRING, TENSION	
159	3-343-511-01	PLATE, LOCK	
160	3-343-502-01	SPRING, TENSION	
161	3-324-499-01	SPRING, TENSION	
162	3-343-520-01	SPRING, TENSION	
164	3-343-507-01	SHIELD, MOTOR	
165	3-324-479-01	HOLDER, MOTOR	
166	3-318-203-71	SCREW (B1.7X5), TAPPING	

No.	Part No.	Description	Remarks
167	3-547-625-00	SCREW, THRUST ADJUST	
168	*3-324-496-01	RETAINER, THRUST	
169	X-3310-957-1	WHEEL ASSY, CAPSTAN	
170	3-315-495-11	WASHER (t=0.13)	
	3-315-495-21	WASHER (t=0.2)	
171	X-3310-975-1	CHASSIS ASSY	
173	3-324-470-01	SHAFT (MOTOR HOLDER)	
174	3-324-494-01	BELT	
175	X-3310-976-1	PULLEY MIDWAY ASSY	
176	3-343-501-01	SPRING, TENSION	
177	3-324-485-01	LEVER (FR)	
180	3-831-441-11	CUSHION (B)	
M901	8-835-277-01	MOTOR, DC MNR-1603A	

SECTION 5
ELECTRICAL PARTS LIST

NOTE:
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF:μF, PF:μμF.

RESISTORS
- All resistors are in ohms.
- F : nonflammable

COILS
- MMH : mH, UH : μH

SEMICONDUCTORS
In each case, U : μ, for example:
UA...: μA..., UPA...: μPA..., UPC...: μPC, UPD...: μPD...

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
901	A-3070-220-A	MOUNTED PCB, AUDIO			
C101	1-163-139-00	CERAMIC CHIP	820PF	10%	50V
C102	1-163-125-00	CERAMIC CHIP	220PF	10%	50V
C103	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C104	1-126-208-11	ELECT	47MF	20%	4V
C105	1-162-638-11	CERAMIC CHIP	1MF		16V
C106	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V
C107	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C108	1-135-087-21	TANTAL. CHIP	0.68MF	10%	20V
C109	1-163-034-00	CERAMIC CHIP	0.033MF	5%	25V
C110	1-163-017-00	CERAMIC CHIP	0.0047MF	5%	50V
C111	1-162-638-11	CERAMIC CHIP	1MF		16V
C112	1-126-210-11	ELECT	220MF	20%	4V
C113	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C114	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C201	1-163-139-00	CERAMIC CHIP	820PF	10%	50V
C202	1-163-125-00	CERAMIC CHIP	220PF	10%	50V
C203	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C204	1-126-208-11	ELECT	47MF	20%	4V
C205	1-162-638-11	CERAMIC CHIP	1MF		16V
C206	1-163-019-00	CERAMIC CHIP	0.0068MF	10%	50V
C207	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C208	1-135-087-21	TANTAL. CHIP	0.68MF	10%	20V
C209	1-163-034-00	CERAMIC CHIP	0.033MF	5%	25V
C210	1-163-017-00	CERAMIC CHIP	0.0047MF	5%	50V
C211	1-162-638-11	CERAMIC CHIP	1MF		16V
C212	1-126-210-11	ELECT	220MF	20%	4V
C213	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C214	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C301	1-126-209-11	ELECT	100MF	20%	4V
C302	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C303	1-126-210-11	ELECT	220MF	20%	4V
C304	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C305	1-126-210-11	ELECT	220MF	20%	4V
C306	1-126-208-11	ELECT	47MF	20%	4V
C308	1-126-210-11	ELECT	220MF	20%	4V
C309	1-126-198-11	ELECT	4.7MF	20%	35V
C310	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C311	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C312	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C313	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C314	1-163-141-00	CERAMIC CHIP	0.001MF	10%	50V
C601	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C602	1-163-023-00	CERAMIC CHIP	0.015MF	10%	50V
C603	1-163-145-00	CERAMIC CHIP	0.0015MF	10%	50V

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
C604	1-135-070-00	TANTAL. CHIP	0.1MF	20%	35V
C605	1-130-483-00	MYLAR	0.01MF	5%	50V
C606	1-124-779-00	ELECT	10MF	20%	16V
C607	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C608	1-135-091-00	TANTAL. CHIP	1MF	10%	16V
C609	1-163-035-00	CERAMIC CHIP	0.047MF	10%	25V
C610	1-163-033-00	CERAMIC CHIP	0.022MF	10%	25V
C611	1-163-021-00	CERAMIC CHIP	0.01MF	10%	50V
C612	1-130-489-00	MYLAR	0.033MF	5%	50V
CN301	1-566-935-11	HOUSING, CONNECTOR 3P			
D301	8-719-812-41	DIODE TLR124 (BATTERY)			
HP901	1-543-481-11	HEAD, MAGNETIC (PLAY BACK), WITH FLEXIBLE PC BOARD			
IC301	8-759-820-19	IC LA4570M			
IC302	8-759-701-07	IC NJM2063AM			
IC601	8-759-909-45	IC CX20084			
J301	1-566-799-11	JACK, OUTER POWER (DC IN 3V)			
J302	1-566-800-11	JACK (HEADPHONES)			
M901	8-835-277-01	MOTOR, DC MNR-1603A			
Q301	8-729-162-44	TRANSISTOR 2SB624-BV4			
Q302	8-729-903-10	TRANSISTOR FMW1			
Q601	8-729-101-07	TRANSISTOR 2SB798			
R101	1-216-025-00	METAL CHIP	100	5%	1/10W
R102	1-216-105-00	METAL CHIP	220K	5%	1/10W
R103	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R104	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R105	1-216-112-00	METAL CHIP	430K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R107	1-216-089-00	METAL CHIP	47K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-093-00	METAL CHIP	68K	5%	1/10W
R110	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R201	1-216-025-00	METAL CHIP	100	5%	1/10W
R202	1-216-105-00	METAL CHIP	220K	5%	1/10W
R203	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R204	1-216-071-00	METAL CHIP	8.2K	5%	1/10W
R205	1-216-112-00	METAL CHIP	430K	5%	1/10W
R206	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R207	1-216-089-00	METAL CHIP	47K	5%	1/10W
R208	1-216-073-00	METAL CHIP	10K	5%	1/10W
R209	1-216-093-00	METAL CHIP	68K	5%	1/10W
R210	1-216-298-00	METAL CHIP	2.2	5%	1/10W
R301	1-216-049-00	METAL CHIP	1K	5%	1/10W

ELECTRICAL PARTS

Ref.No.	Part No.	Description			
R302	1-216-005-00	METAL CHIP	15	5%	1/10W
R303	1-216-037-00	METAL CHIP	330	5%	1/10W
R304	1-216-051-00	METAL CHIP	1.2K	5%	1/10W
R305	1-216-129-00	METAL CHIP	2.2M	5%	1/10W
R306	1-216-081-00	METAL CHIP	22K	5%	1/10W
R307	1-216-037-00	METAL CHIP	330	5%	1/10W
R308	1-216-089-00	METAL CHIP	47K	5%	1/10W
R601	1-216-092-00	METAL CHIP	62K	5%	1/10W
R602	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R603	1-216-089-00	METAL CHIP	47K	5%	1/10W
R604	1-216-105-00	METAL CHIP	220K	5%	1/10W
R605	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R606	1-216-097-00	METAL CHIP	100K	5%	1/10W
R607	1-216-091-00	METAL CHIP	56K	5%	1/10W
R608	1-216-073-00	METAL CHIP	10K	5%	1/10W
RV101	1-237-005-21	RES, ADJ, METAL GLAZE 22K (DOLBY LEVEL ADJ)			
RV201	1-237-005-21	RES, ADJ, METAL GLAZE 22K (DOLBY LEVEL ADJ)			
RV301	1-237-872-21	RES, VAR 10K (VOLUME)			
RV601	1-237-005-21	RES, ADJ, METAL GLAZE 22K (SPEED ADJ)			
S301	1-571-277-21	SWITCH, SLIDE (TAPE)			
S302	1-571-275-21	SWITCH, SLIDE (DOLBY NR)			
S303	1-571-276-21	SWITCH, LEAF (POWER)			

ACCESSORY & PACKING MATERIAL

Part No.	Description
3-324-441-01	INDIVIDUAL CARTON
3-343-522-01	CUSHION
3-343-529-01	SPACER
3-343-525-01	CASE, CARRYING
3-570-631-61	BAG, POLYETHYLENE
3-703-910-01	(BLACK)....LABEL, COLOR
3-703-920-01	(RED).....LABEL, COLOR
3-703-921-01	(SILVER)...LABEL, COLOR
3-769-606-11	MANUAL, INSTRUCTION
8-952-260-91	HEADPHONE MDR-W10L/B SET

SONY Servicehilfe

Datum: 14.04.88 Ref.: TC-00788 Modell: WM-DDI SE

ET- Nummerninfo: Motorhalterung Code: 610/620 Hue

Die Halterung des Capstanmotors steht in einer verbesserten Ausführung zur Verfügung.

Die ET- Nummer der Halterung lautet:

Ref.-Nr.	Bezeichnung	alte ET.-Nr.	neue ET.-Nr.
165	Holder, Motor	3-324-479-01	3-343-534-01

Ab folgenden Seriennnummern ist die geänderte Motorhalterung vorhanden.

Seriennummer	Gerätefarbe
126701	Black
134801	Silver
138701	Red

ONY DEUTSCHLAND GmbH, Hugo-Eckener-Straße 20, 5000 Köln 30, Tel.: 0221/5962-0